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A PARTIAL KEY TO THE GENERA OF NORTH AMERICAN JASSOIDEA.

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(By permission of the Chief of the Bureau of Entomology.)

THE hemipterous group Jassoidea includes such Homoptera as have many spines on the hind tibiæ and also have the antennæ inserted between the eyes.

Because of their abundance, the increasing recognition of their economic importance, and the lack of knowledge concerning the distribution, habits and life histories of the greater number of the species, these interesting insects deserve more general study. The present paper is to some degree tentative and experimental, but is offered in the hope that it may be of use to students in arranging their material. The subfamily Athysaninæ, in the Acocephalidæ, and the family Typhlocybidæ are not treated.

Literature on the genera and higher groups of America north of Mexico has appeared as follows:

Mr. Wm. H. Ashmead (Ent. Amer., v. 5, July, 1889) and Mr. E. P. Van Duzee (Ent. Amer., v. 5, Sept. 1889) each published a key to the genera of Bythoscopidæ from Edwards' "Synopsis of the British Cicadinæ" Prof. Chas. W. Woodworth (Psyche, v. 5, pp. 211–214, July, 1889) gave a synopsis of the genera of Typhlocybidæ (Typhlocybini). Mr. Van Duzee (Trans. Am. Ent. Soc., v. 19, pp. 295–307, 1892), in his well-known "Synopsis," gives keys to the families and to the genera of Acocephalidæ (Jassidæ). Prof. C. F. Baker (Psyche, v. 8, p. 76, 1892) erected the family Kœbelidæ (Kœbeliinæ). Prof. C. P. Gillette (Proc. U. S. Natl. Museum, v. 20, pp. 709–773, 1898) monographs the Typhlocybidæ (Typhlocybinæ), and Dr. E. D. Ball (Proc. Iowa Acad. Sci., v. 8, 1901) has done the same for the Tettigoniellidæ (Tettigonidæ) in part. Prof. Herbert Osborn (Bull. 97 N. Y. State Museum, p. 500, 1905) gives a key to the families.

The late Dr. F. H. Snow and Prof. S. J. Hunter of the University of Kansas, by their kindness and coöperation made this paper possible. Much of its completeness is due to work done in the National Museum, through the courtesy of Dr. L. O. Howard and Messrs. J. C. Crawford, jr., Otto Heidemann, W. D. Hunter, and A. C. Morgan. To all these, and to those who by gifts of material and other favors have been of assistance, the author desires to express his hearty thanks.

Several terms used in the keys may require explanation. The term *vertex* is loosely applied to all the head, exclusive of the eyes, which is visible from directly above. The width is measured at the narrowest point between the eyes. The part extending back of the eyes is not considered in discussing the shape of the vertex. The *face*, likewise, includes all of the head, exclusive of the eyes, which is visible from directly below. The clypeus is said to be expanded at the apex when it is broader at or near the apex than at some point nearer the clypeal suture. Other details are given in plate I.

Many species, especially in the Jassidæ and Acocephalidæ, are sexually dimorphic, and occur frequently in both short- and long-winged forms.

FAMILIES OF JASSOIDEA.

A. Ocelli on face below anterior margin of vertex.

  B. With a broad, thin margin between vertex and front .... KŒBELIDÆ

  BB. Without a broad, thin margin between vertex and front. Front less than three times as long as its width between the antennæ. Loræ usually enclosed below by the margin of the cheek.

    C. Vertex and front distinctly limited .... PAROPIDÆ

    CC. Vertex and front not distinctly limited, but rounding into each other. Ocelli exposed on the face in very slight impressions or none. BYTHOSCOPIDÆ

AA. Ocelli on the vertex.

  B. Ocelli rarely nearer anterior margin of vertex than posterior. Inner margin of eye not depressed below the vertex bordering it. Lateral carina of pronotum not below center of eye (except in ***Bathysmatophorus***). Ocelli prominent.

    C. Form narrow, cylindrical. Profile of face and vertex rounded or obtuse Vertex usually bright colored or bearing curved or branching lines. TETTIGONIELLIDÆ

    CC. Form depressed, broader. Profile of face and vertex acute, or the face impressed immediately beneath the vertex, producing a more or less rounding or overhanging ledge (except in ***Bathysmatophorus***). Vertex rarely bright colored, and marked, if at all, with a few straight longitudinal stripes .... GYPONIDÆ

  BB. Ocelli very near anterior margin of vertex; much nearer anterior margin than posterior.① Inner margin of eye depressed distinctly below the vertex bordering it. Lateral carina of pronotum below center of the eye; usually abruptly descending back of eye. Ocelli often indistinct .... JASSIDÆ

AAA. Ocelli on or very near anterior margin of vertex, or wanting.①

  B. Elytra often subcoriaceous, usually angulated at tip of clavus; clavus acute, subacute or blunt, never attenuately pointed (plate I, fig. 7). Ocelli rarely absent although often hard to distinguish .... ACOCEPHALIDÆ

  BB. Elytra membranous, not angulated at tip of clavus; clavus attenuately pointed (plate I, fig. 5); elytra always much longer than the abdomen. Ocelli rarely present .... TYPHLOCYBIDÆ (Plate I, fig. 6.)

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1. In such genera of Acocephalidæ (*Stronglylocephalus* and *Acocephalus*) as might be confused with Jassidæ because of the position of the ocelli, which are placed superiorly very near the anterior margin of the vertex, there is a strong, narrow emargination of the eye next the entennæ. This is not found in the preceding groups.

GENUS OF KŒBELIDÆ.

Front three times as long as its width between the antennæ. Loræ not enclosed below by the margin of the cheek.. *Kœbelia* (Plate II, figs. 8 and 9.)

GENUS OF PAROPIDÆ.

Each ocellus set in a broad, deep, oblique groove.................................... *Paropulopa*

GENERA OF BYTHOSCOPIDÆ.

- A. Pronotum without a lateral carina. Side margin of pronotum very short or absent.
  - B. Pronotum strongly, subangularly produced between the eyes. Extreme tip of elytron at or below the center of elytron. Venation clean-out, elevated.
    - C. Vertex rounded rectangular. Indefinite striations of pronotum extending diagonally backward each side of the median line........... *Pediopsis*
    - CC. Vertex rounded, angle greater than a right angle. Indefinite striations of pronotum usually transverse.............................. *Bythoscopus*
  - BB. Pronotum rarely subangularly produced between the eyes (sometimes so in *Agallia*). Vertex transverse, obtusely angled, often parallel margined. Elytral veins not elevated.
    - C. Elytra not overlapping at apex (appendix not developed). Clypeus usually parallel margined. Extreme tip of elytron above center of elytron. ② *Agallia*
    - CC. Elytra overlapping at apex (appendix strongly developed). Clypeus expanded at apex.. *Idiocerus*
- AA. Pronotum with a distinct lateral carina and comparatively long side margin; flaring behind; anterior margin broadly, gently, curved. Elytra more or less punctured, usually pubescent or hairy.
  - B. Pronotum not wider behind than the head. Clypeus strongly tapering. Front not wider than the clypeus at the suture............................ *Straganiopsis*
  - BB. Pronotum wider posteriorly than the head. Clypeus parallel margined. Front distinctly wider than the clypeus at the suture........................ *Macropsis*

GENERA OF TETTIGONIELLIDÆ.

- A. Lateral carina of pronotum (arising back of center of eye) present; strongly obliquely ascending to the posterior angle of pronotum. Root of elytron, viewed from the side, higher than the eye.
  - B. Margin of vertex above antennal pit, viewed from above, not emarginate in front of eye; not exposing any basal joints of the antennæ. Clypeus as long as broad and widest beyond the base.
    - C. Profile of vertex rounding on to the front, from which it is not distinctly separated. Elytra subcoriaceous, membraneous only at tip.. *Oncometopia*
    - CC. Profile of vertex flat and distinctly separated from the front. Elytra usually more or less vitreous throughout..................... *Homalodisca*
  - BB. Margin of vertex above antennal pit, viewed from above, emarginate in front of eye; exposing one or more basal joints of the antennæ. Clypeus broader than long and widest at base.. *Aulacizes*
- AA. Lateral carina of pronotum gently ascending, subhorizontal, or absent. Root of elytron, viewed from the side, not higher than the eye.
  - B. Posterior margin of pronotum long; the margin straight, or broadly gently, emarginate.
    - C. Elytra not reticulate veined at apex and not punctate. Lateral carina usually present on pronotum.

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2. Kirkaldy (Bull. 3, Hawaiian Sugar Planters' Ass., pp. 30-31; 1907) has divided the genus *Agallia* into three genera, *Aceratagallia*, *Agalliopsis*, and *Agallia*, representing groups AA., A. BB., and A. B., respectively, of Osborn and Ball's synopsis of *Agallia* (Proc. Dav. Acad. Sci., v. 7, pp. 47-48, 1898). These have not been included here, as the groups do not seem to have more than subgeneric value.

GENERA TETTIGONIELLIDÆ.—*continued.*

D. Vertex and front, in profile, not distinctly limited but rounding into each other. Vertex variously marked but without a dark line on anterior margin............................③ *Tettigoniella*

DD. Vertex and front, in profile, distinctly limited. Vertex usually with a dark line on anterior margin................*Diedrocephala*

CC. Elytra reticulate veined at apex. Lateral carina of pronotum absent. *Dræculacephala*

BB. Posterior margin of pronotum short; rather abruptly emarginate. Elytra closely punctured. Lateral carina of pronotum absent........................*Helochara*

GENERA OF GYPONIDÆ.

A. Pronotum with a distinct humeral margin (plate I, fig. 1, *Hm.*). Lateral carina of pronotum normal.

B. Humeral and posterior margins of pronotum subequal. Posterior margin narrowly emarginate. Pronotum and claval areas coarsely pitted. Profile of vortex and front acute and but very slightly depressed below the anterior margin. *Xerophloea*

BB. Humeral margin of pronotum less than half as long as posterior margin. Posterior margin broadly, gently, emarginate. Pronotum and claval areas neither punctate nor pitted.

C. Clavus not truncate at tip. Frontal sutures not appearing on the vertex...*Gypona*

CC. Clavus broadly truncate at tip. Frontal sutures attaining the ocelli. *Penthimia*

AA. Pronotum without a humeral margin.

B. Pronotum wider posteriorly than the head. Ocelli about midway between anterior and posterior margins of vertex. Lateral carina of pronotum usually abrubtly descending back of eye...............................④*Bathysmatophorus*

BB. Head as wide as pronotum, Pronotum but little flaring. Ocelli nearer anterior than posterior margin of vertex. Lateral carina of pronotum straight. *Errhomenellus*

GENERA OF JASSIDÆ.

A. Front widest at base. Clypeus at most but gradually enlarged toward the apex; usually parallel margined or tapering.

B. Vertex with a median carina, which also extends down the front. Clypeus tapering...*Euacanthus*

BB. Vertex and front without a median carina.

C. Clypeus tapering to a rounded apex. Vertex not distinctly or subequilaterally pentagonal. Anterior margin of pronotum produced far between the eyes and nearly straight. Eyes rather prominent. Vertex, and profile of front and vertex, strongly conical. Antennæ of normal length...*Pagaronia*

CC. Clypeus parallel margined or expanded at apex. Vertex distinctly and subequilaterally pentagonal. Anterior margin of pronotum gently curved. Profile of front and vertex usually obtuse. Antennæ exceedingly long..⑤*Neocœlidia*

AA. Front as wide at clypeus as at base. Clypeus very strongly, abruptly, enlarged at apex.

B. Vertex cuneiform. Scutellum very small...*Tinobregmus* (Plate II, figs. 1 and 2.)

BB. Vertex subquadrate. Scutellum very large.........*Jassus* (Plate I, figs. 8 and 9.)

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3. Distant (Faun. Brit. India, v. 4, p. 223; 1907) has erected the genus *Kolla* to include such species of Tettigoniella (*tripunctata, geometrica, bifida,* etc.) as have the head particularly deep and short. Tettigoniella, as thus limited, would include such species as *hieroglyphica* and *gothica.*

4. These last two genera appear to have no special relationship with each other, and little with anything that precedes or follows.

5. *Paracœlidia* Baker was founded (Can. Ent., v. 30, p. 292) upon *P. tuberculata* from the Atlantic coast. It differs from *Neocœlidia* only in having the clypeus tuberculate near the apex, and is not included here, as this character does not seem to be of generic importance.

SUBFAMILIES OF ACOCEPHALIDÆ.

A. Frontal suture arising or directed between the ocelli (plate II, fig. 4),⑥ or the ocelli placed superiorly near anterior margin of vertex. Pronotum usually with a lateral carina. Clypeus with margins parallel or strictly subparallel (except in *Platymetopius*).
ACOCEPHALINÆ

AA. Frontal suture arising directly beneath ocellus or between ocellus and eye (plate I, fig. 2). Ocelli on anterior margin of vertex before the eye. Pronotum rarely with a lateral carina. Clypeus parallel margined or not.......................................ATHYSANINÆ

GENERA OF ACOCEPHALINÆ.

A. Ocelli either placed superiorly near anterior margin of vertex or on the anterior margin with the profile of face and vertex broadly rounded. Elytra longer than abdomen. Claval suture not distinctly curved at tip.......................................*Acocephalini*

B. Vertex not rectangular, including distinctly less than two-thirds the length of the pronotum. Clavus not punctate-striate.

C. Ocelli superior. Front broad, flat. Size medium or rather small.

D. Extreme tip of elytron at center of elytron. Vertex with striæ parallel to anterior margin.....................*Strongylocephalus*

DD. Extreme tip of elytron distinctly above center of elytron. Anterior margin of vertex not striate.....................*Acocephalus*

CC. Ocelli on obtuse, rounded margin of vertex and margined with pale, Front swollen, very convex. Size very small.
Xestocephalus (Plate II, figs. 10 and 11.)

BB. Vertex rectangular, including two-thirds the length of the pronotum. Clavus strongly punctate-striate................*Goniagnathus* (Plate II, figs. 12 and 13.)

AA. Ocelli before middle of eye on anterior margin of vertex, Profile of face and vertex usually acute and never broadly rounded. Eyes without an antennal emargination. Elytra often shorter than abdomen. Claval suture curved at extreme tip......*Dorydini*

B. Vertex and face in profile not separated by a thin margin or by a line beneath the anterior margin of vertex. Lateral carina of pronotum distinctly oblique. ⑦
Memnonia (Plate II, figs. 5 and 6.)

BB. Vertex and face in profile, separated either by a thin margin or by a pigment line beneath anterior margin of vertex.

C, Vertex rarely acutely angled, but broad, ligulate, or roundingly produced. Clypeus not expanded at apex. Front usually distinctly less than three times as long as its middle breadth.

D. Without pigment lines in cells of elytra.

E. Vertex with a median carina. Claval veins united posteriorly.

F. Vertex usually ligulate; at least twice as long as broad. Pronotum without a distinct median carina..............................*Dorycephalus*

FF. Vertex bluntly conical; less than twice as long as broad. ⑧ Pronotum with a distinct mediam carina. Color black, *Neoslossonia* (Plate II, fig. 7.)

EE. Vertex without a median carina. Claval veins not united posteriorly, but running separately to the margin of elytron (except in *Spanbergiella*).

F. With but one claval vein. Vertex and pronotum bearing converging red stripes.
Spanbergiella (Plate II, figs. 3 and 4.)

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6. Be careful not to mistake a color line curving inward below the ocellus for the frontal suture.

7. In forms under BB, likely to be confusing because of the character of the profile the lateral carina of pronotum is distinctly horizontal.

8. Only the male of *Neoslossonia* is known. The female may more closely resemble *Dorycephalus* in the character of the vertex.

GENERA OF ACOCEPHALINÆ.—*continued.*

FF. With two claval veins.

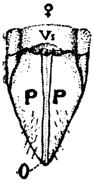
G. Vertex bearing parallel longitudinal stripes or none. Outline of vertex in female (plate I, figs. 3 and 4) with a slight, abrupt emargination at anterior point of eye................................*Hecalus*

GG. Vertex and pronotum never with more than a median white line. Vertex without an emargination at anterior point of eye........................*Parabolocratus*

DD. With pigment lines in cells of elytra..................*Dicyphonia*

CC. Vertex acutely angled. Clypeus distinctly expanded at apex. Front three or more times as long as its middle breadth..........*Platymetopius*

PLATE I.



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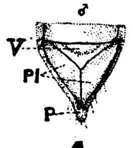

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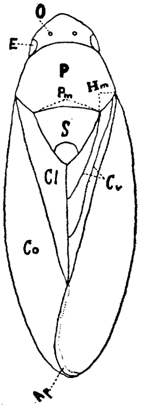

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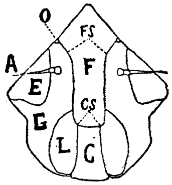

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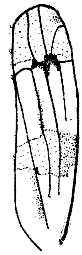

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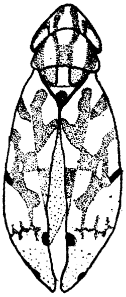

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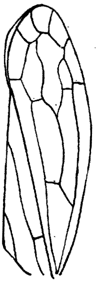

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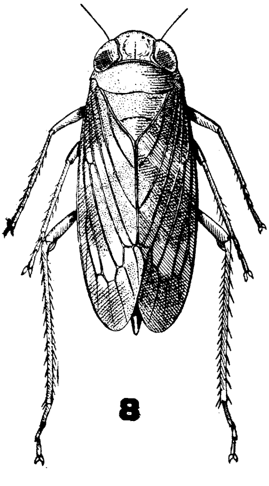

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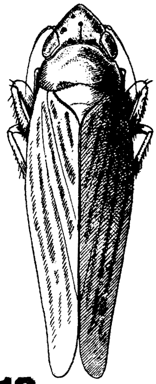

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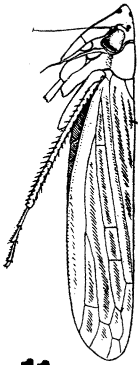

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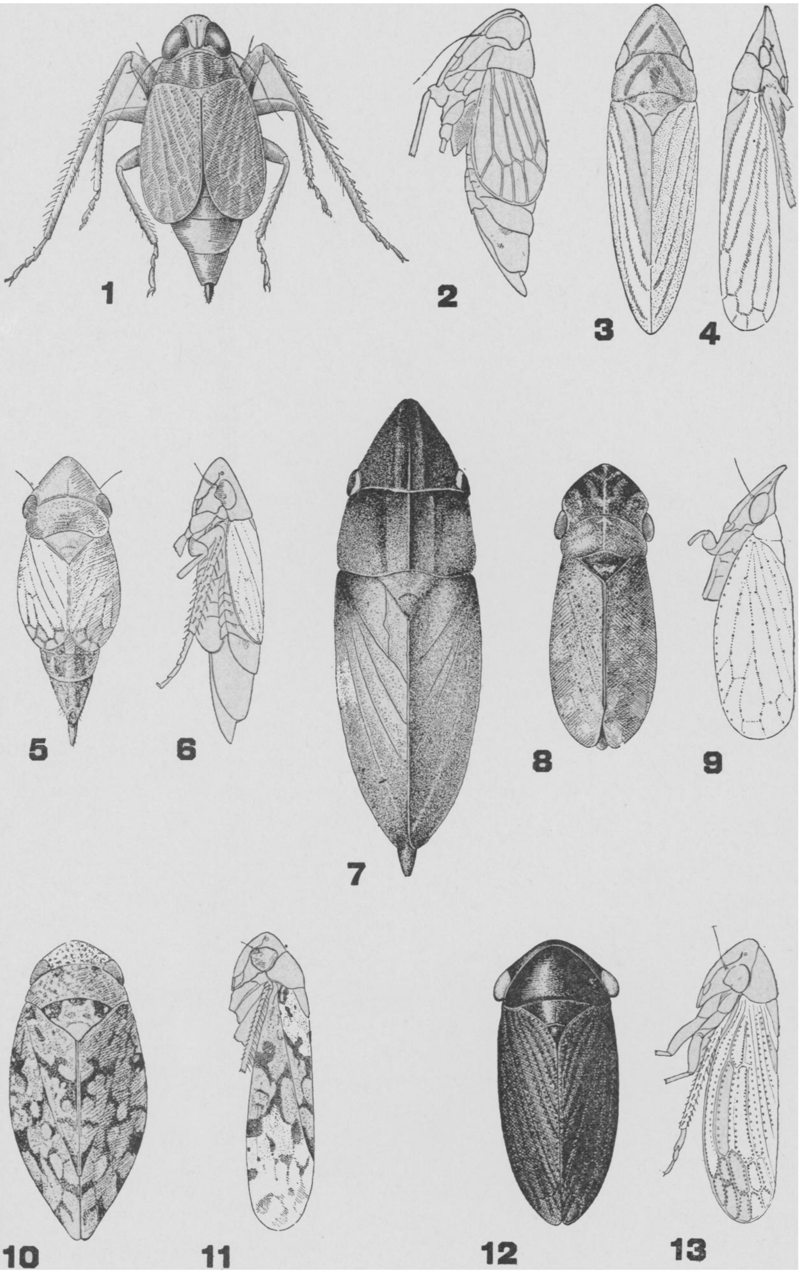
PLATE II.



Bibliographical data are given below on such genera included in this paper as have appeared in our fauna or have been erected since the publication of VanDuzee's "Catalogue of the Described Jassoidea of North America"(Trans. Am. Ent. Soc., v. 21, pp. 245-317; 1894). Type species are included in brackets.

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  Neue Gattung und Arten in Homoptera. Verhandlungen der k. k. Zool Bot. Gesell., v. 16; Wien 1866.

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Kolla Distant [insignis Distant].
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Tettigoniella Jacobi [viridis Linn].
  Tetigonia Geoffroy Hist. abrégée des Ins., v. 1, p. 429; 1799. [nom. præocc.]
  Tettigoniella Jacobi Zool. Jahr. Syst., v. 19; p. 778; 1904. nom. nov.]

Errhomenellus Puton [brachypterus Minck.] [Fieber.]
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  Errhomenellus Puton Catalogue des Hémiptéres 1899. [nom. nov.]

Bathysmatophorus Baker [uhleri Baker] = [Uhler Mss. Lystridea conspersa].
  Psyche, Sept., 1898, pp. 260, 261.

Pagaronia Ball [13-punctata Ball].
  Can. Ent., v. 34, p. 19; 1902.

Neocœlidia Gillette and Baker [tumidifrons G. & B.].
  Colorado Ag. Ex. Sta. Bull. 31, p. 103; 1895. Emended Can. Ent., v. 30, p. 289; 1898.

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  Proc. Iowa Acad. Sci. for 1899 (1900), p. 66.

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  Van Duzee Bull. Buffalo Soc. Nat. Sci., v. 9, p. 218; 1909.
  Osborn Proc. Davenport Acad. Sci., v, 10, p. 163; 1907. Described putnami.

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  Proc. Iowa Acad. Sci. for 1899 (1900), p. 69.